July 10, 2006

Peter Van Alyea
Redwood Oil Company
50 Professional Center Dive, Suite 100
Rohnert Park, CA 94928

Ground Water Monitoring Report
May 2006
Former Redwood Oil Bulk Plant
105 X Street
Eureka, California
ECM Project #99-110-04

Dear Mr. Van Alyea:

This report provides the results of quarterly ground water monitoring at the Former Redwood Oil Bulk Plant at 105 X Street in Eureka, California (Figure 1, Appendix A). On May 23, 2006, ECM Group personnel visited the site. Ground water elevations were measured in the six monitoring wells and ground water samples were collected from four of the six monitoring wells (MW-1, MW-3, MW-5, and MW-6) in accordance with the site monitoring program.[1] The well locations are shown on Figure 2 (Appendix A).

Ground water levels were measured in each of the six monitoring wells. Free-phase hydrocarbons were not observed in any of the wells. Wellheads and well vaults were observed to be in good condition. Water level data is shown in Table 1 (Appendix B) and a ground water elevation contour map is included as Figure 2 (Appendix A).

The samples were forwarded under chain of custody record to Entech Analytical Labs, of Santa Clara, California for analysis. Analytical results for ground water are included in Tables 2 and 3 (Appendix B). Ground water samples were collected in accordance with ECM Standard Operating Procedure - Ground Water Sampling (Appendix E). The chain of custody document and laboratory analytical reports are included as Appendix C. The water sampling data sheets are included as Appendix D. Purge water and decon rinseate were transported to an ROC holding tank for proper disposal.

---

[1] Monitoring and Reporting Program No. R1-2004-0113 for Redwood Oil Company, 105 X Street, Eureka, CA, December 2, 2004.

Analytical results for this sampling event were consistent with results from prior sampling events. Analyses were performed in accordance with the site monitoring schedule. Samples from wells MW-1, MW-3, and MW-5 were analyzed for TPH(G), BTEX hydrocarbons, and MTBE. The sample from well MW-6 was analyzed for MTBE.

The concentrations of MTBE reported in the sample from well MW-1 was consistent with the concentrations reported in samples from previous monitoring events. TPH(G) and BTEX hydrocarbons were not detected in the sample. A trend of decreased contaminant concentrations during periods of increased depth to water (falling ground water table) has developed for MW-1.

Well MW-2 is sampled on a semi-annual basis in February and August. Analytical results for MW-2 have shown a reduction trend in contaminant concentrations over time.

Low concentrations of BTEX compounds and MTBE were detected in the sample from well MW-3. TPH(G) was also detected in the sample. All detections were consistent with a trend of decreasing contaminant concentrations in samples from MW-3.

Well MW-4 is located upgradient from the impacted area of the site and is sampled on an annual basis in February. Samples from MW-4 are analyzed for MTBE. Low concentrations of MTBE have been detected previously in samples from MW-4.

Analytical results for the May 2006 sample from well MW-5 were consistent with results from previous samples. A low concentration of TPH(G) was detected in the sample from well MW-5. BTEX compounds were not detected in the sample. MTBE concentrations detected in each of the last five samples collected from MW-5 have been significantly lower than concentrations in samples collected previously from MW-5. MW-5 is located approximately 10 to 15 ft downgradient from the 2004 remedial excavation. Reduced MTBE concentrations are considered a result of the remedial excavation.

Well MW-6 is located downgradient from well MW-5. The sample from well MW-6 was analyzed for MTBE. MTBE was detected at a very low concentration in the sample. The concentrations of MTBE detected in the last two samples from MW-6 have been significantly lower than concentrations detected in previous samples.

The MTBE concentrations reported in samples from wells MW-3, MW-4, MW-5, and MW-6 are consistently below the secondary MCL standard of 5 ppb. The MTBE results for samples from MW-1 are below the MCL during the dry season and above the MCL during the rainy season. The MTBE concentrations reported in samples from well MW-2 are trending downward toward the MCL level.

Thank you for the opportunity to provide environmental services to Redwood Oil Company. Please call if you have any questions.

Sincerely,
ECM Group

David Hazard
Environmental Scientist

Chris Bramer
Professional Engineer #C048846

Appendices:
A - Figures
B - Tables
C - Chain of Custody and Laboratory Analytical Reports
D - Water Sampling Data Sheets
E - Standard Operating Procedure

cc: Kasey Ashley, North Coast Regional Water Quality Control Board
Mark Inglis, Chevron Products Co.

C4:\ECMQMs\110.04May06

APPENDIX A

FIGURES

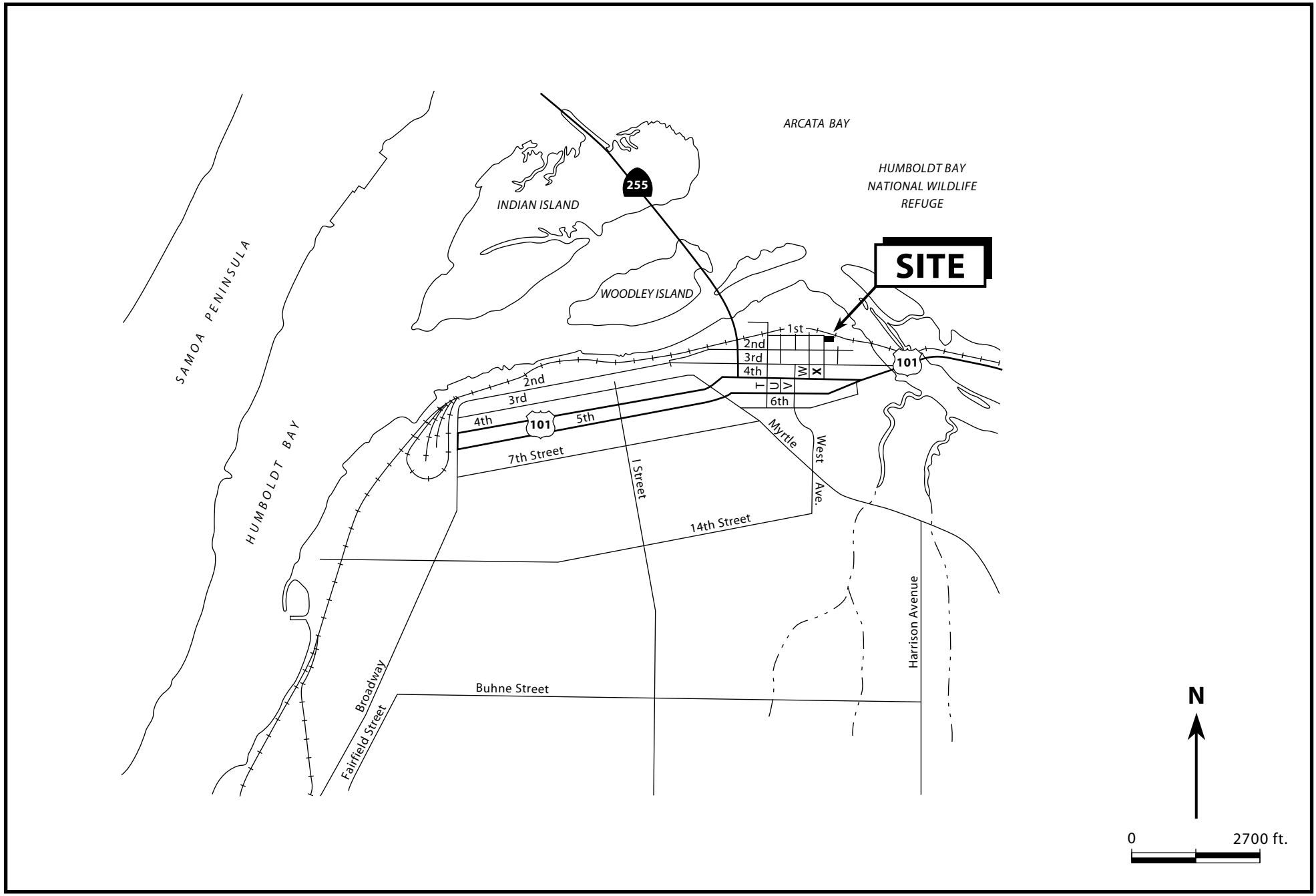

Figure 1. Site Location Map - Former Redwood Oil Bulk Plant, 105 X Street, Eureka, California

EXPLANATION

MW-6	Monitoring well
8.02	Ground water elevation, in feet above mean sea level
[7.87]	Ground water elevation not used in contour
8.00	Ground water elevation contour, dashed where inferred

Approximate ground water flow direction with an approximate gradient of 0.006 ft/ft

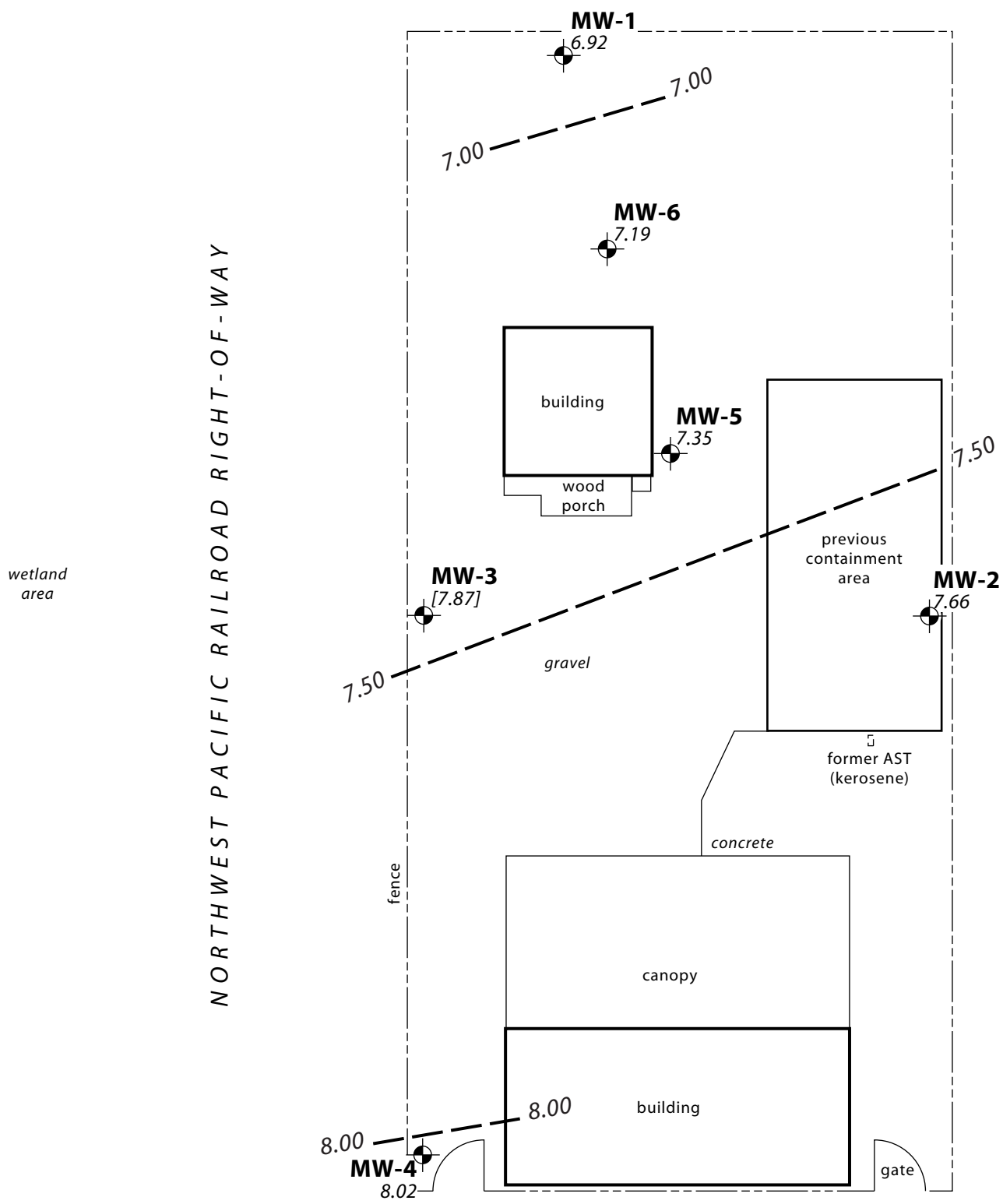

Figure 2. Monitoring Well Location and Groundwater Elevation Contour Map - May 23, 2006 - Former Redwood Oil Bulk Plant, 105 X Street, Eureka, California

APPENDIX B

TABLES

Table 1. Monitoring Well Survey Data, Well Construction Details and Depth to Ground Water - 105 X Street, Eureka, California.

Well ID	Sample Date	DTW (Ft)	TOC (Ft, msl)	GWE (Ft, msl)	Screen Interval	Sand Pack Interval	Bentonite/ Grout Interval	Notes
MW-1	5/14/2001	2.45	9.30	6.85	2 - 12	2 - 12	0 - 2	
	8/13/2001	2.92		6.38				
	11/9/2001	2.63		6.67				
	2/14/2002	1.84		7.46				
	5/1/2002	1.85		7.45				
	8/8/2002	2.91		6.39				
	11/15/2002	2.26		7.04				
	2/14/2003	1.78		7.52				
	5/23/2003	2.14		7.16				
	8/26/2003	2.85		6.45				
	11/17/2003	2.66		6.64				
	2/23/2004	1.38		7.92				
	5/13/2004	2.34		6.96				
	8/17/2004	2.76		6.54				
	11/23/2004	2.17		7.13				
	2/23/2005	1.68		7.62				
	8/17/2005	2.78		6.52				
	11/16/2005	1.46		7.84				
	2/14/2006	1.90		7.40				
	5/23/2006	**2.38**		**6.92**				
MW-2	5/14/2001	3.28	10.96	7.68	2 - 12	2 - 12	0 - 2	
	8/13/2001	3.63		7.33				
	11/9/2001	3.41		7.55				
	2/14/2002	2.90		8.06				
	5/1/2002	2.85		8.11				
	8/8/2002	3.71		7.25				
	11/15/2002	2.92		8.04				
	2/14/2003	2.88		8.08				
	5/23/2003	3.11		7.85				
	8/26/2003	3.65		7.31				
	11/17/2003	3.40		7.56				
	2/23/2004	2.45		8.51				
	5/13/2004	3.28		7.68				
	8/17/2004	3.49		7.47				

Table 1. Monitoring Well Survey Data, Well Construction Details and Depth to Ground Water - 105 X Street, Eureka, California.

Well ID	Sample Date	DTW (Ft)	TOC (Ft, msl)	GWE (Ft, msl)	Screen Interval	Sand Pack Interval	Bentonite/ Grout Interval	Notes
MW-2	11/23/2004	2.99	10.96	7.97	2 - 12	2 - 12	0 - 2	
	2/23/2005	3.86		7.10				
	8/17/2005	3.55		7.41				
	11/16/2005	2.36		8.60				
	2/14/2006	2.84		8.12				
	5/23/2006	**3.30**		**7.66**				
MW-3	5/14/2001	2.81	10.37	7.56	2 - 12	2 - 12	0 - 2	
	8/13/2001	3.29		7.08				
	11/9/2001	2.98		7.39				
	2/14/2002	2.12		8.25				
	5/1/2002	1.99		8.38				
	8/8/2002	3.42		6.95				
	11/15/2002	2.44		7.93				
	2/14/2003	2.11		8.26				
	5/23/2003	2.38		7.99				
	8/26/2003	3.39		6.98				
	11/17/2003	2.60		7.77				
	2/23/2004	1.60		8.77				
	5/13/2004	2.72		7.65				
	8/17/2004	3.19		7.18				
	11/23/2004	2.29		8.08				
	2/23/2005	1.66		8.71				
	8/17/2005	2.96		7.41				
	11/16/2005	1.30		9.07				
	2/14/2006	1.89		8.48				
	5/23/2006	**2.50**		**7.87**				
MW-4	5/14/2001	3.19	11.20	8.01	2 - 12	2 - 12	0 - 2	
	8/13/2001	3.63		7.57				
	11/9/2001	3.39		7.81				
	2/14/2002	2.57		8.63				
	5/1/2002	2.42		8.78				
	8/8/2002	3.89		7.31				
	11/15/2002	3.12		8.08				

Table 1. Monitoring Well Survey Data, Well Construction Details and Depth to Ground Water - 105 X Street, Eureka, California.

Well ID	Sample Date	DTW (Ft)	TOC (Ft, msl)	GWE (Ft, msl)	Screen Interval	Sand Pack Interval	Bentonite/ Grout Interval	Notes
MW-4	2/14/2003	2.58	11.20	8.62	2 - 12	2 - 12	0 - 2	
	5/23/2003	2.88		8.32				
	8/26/2003	3.94		7.26				
	11/17/2003	3.10		8.10				
	2/23/2004	2.19		9.01				
	5/13/2004	3.14		8.06				
	8/17/2004	2.04		9.16				
	11/23/2004	2.93		8.27				
	2/23/2005	2.39		8.81				
	8/17/2005	3.70		7.50				
	11/16/2005	2.05		9.15				
	2/14/2006	2.46		8.74				
	5/23/2006	**3.18**		**8.02**				
MW-5	2/14/2003	2.39	10.26	7.87	2 - 12	2 - 12	0 - 2	
	5/23/2003	2.66		7.60				
	8/26/2003	3.36		6.90				
	11/17/2003	3.09		7.17				
	2/23/2004	1.90		8.36				
	5/13/2004	2.93		7.33				
	8/17/2004	3.25		7.01				
	11/23/2004	2.64		7.62				
	2/23/2005	2.19		8.07				
	8/17/2005	3.33		6.93				
	11/16/2005	1.94		8.32				
	2/14/2006	2.36		7.90				
	5/23/2006	**2.91**		**7.35**				

Table 1. Monitoring Well Survey Data, Well Construction Details and Depth to Ground Water - 105 X Street, Eureka, California.

Well ID	Sample Date	DTW (Ft)	TOC (Ft, msl)	GWE (Ft, msl)	Screen Interval	Sand Pack Interval	Bentonite/ Grout Interval	Notes
MW-6	2/14/2003	2.03	9.69	7.66	2 - 12	2 - 12	0 - 2	
	5/23/2003	2.33		7.36				
	8/26/2003	3.03		6.66				
	11/17/2003	2.81		6.88				
	2/23/2004	1.56		8.13				
	5/13/2004	2.56		7.13				
	8/17/2004	2.96		6.73				
	11/23/2004	2.37		7.32				
	2/23/2005	2.17		7.52				
	8/17/2005	2.86		6.83				
	11/16/2005	1.75		7.94				
	2/14/2006	2.16		7.53				
	5/23/2006	**2.50**		**7.19**				

Explanation:

DTW = Depth to Water msl = Mean Sea Level
ft = feet
TOC = Top of Casing
GWE = Ground Water Elevation

Table 2. Analytical Results for Ground Water - Monitoring Wells - 105 X Street, Eureka, California.

Sample ID	Date Sampled	TPPH (D)	TPPH(MO)	TPPH (G)	Benzene	Toluene	Ethylbenzene	Xylenes	Notes
		<---------- ppb ---------->							
MW-1	5/14/2001	<50	<170	<50	<0.5	<0.5	<0.5	<0.5	
	8/13/2001	<50	<170	<50	<0.5	<0.5	<0.5	<0.5	
	11/9/2001	<50	<170	<50	<0.5	<0.5	<0.5	0.51	
	2/14/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	5/1/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/8/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	11/15/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/14/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/26/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/23/2004	<50	<170	130	<0.50	<0.50	<0.50	<0.50	
	8/17/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/23/2005	---	---	230	---	---	---	---	Sample flagged by lab. See lab report for details.
	4/21/2005	---	---	130	<1	1.7	<1	2.0	
	8/17/2005	---	---	<50	<0.50	0.67	<0.50	1.0	
	11/16/2005	---	---	86	6.7	4.9	1.3	6.6	
	2/14/2006	---	---	<100	3.0	1.7	<1.0	3.5	
	5/23/2006	**---**	**---**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-2	5/14/2001	190	<170	660	<0.5	<0.5	<0.5	<0.5	
	8/13/2001	140	<170	890	<0.5	<0.5	<0.5	<0.5	
	11/9/2001	<50	<170	300	<0.5	<0.5	<0.5	0.5	
	2/14/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	5/1/2002	<50	<170	180	<0.50	<0.50	<0.50	<0.50	
	8/8/2002	<50	<170	190	<0.50	<0.50	<0.50	<0.50	
	11/15/2002	<50	<170	290	<0.50	<0.50	<0.50	<0.50	
	2/14/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/26/2003	<50	<170	140	<0.50	<0.50	<0.50	<0.50	
	2/23/2004	<50	<170	<50	<0.50	<0.50	<0.50	0.5	
	8/17/2004	51	<170	240	<0.50	<0.50	<0.50	<0.50	
	2/23/2005	---	---	<50	---	---	---	---	
	8/17/2005	---	---	83	<0.50	0.51	<0.50	0.99	
	2/14/2006	---	---	<50	<0.50	<0.50	<0.50	<0.50	

Table 2. Analytical Results for Ground Water - Monitoring Wells - 105 X Street, Eureka, California.

Sample ID	Date Sampled	TPPH (D)	TPPH(MO)	TPPH (G)	Benzene	Toluene	Ethylbenzene	Xylenes	Notes
		<---------- ppb ---------->							
MW-3	5/14/2001	930	<170	2,900	28	45	140	69	
	8/13/2001	730	<170	3,600	31	49	140	99	
	11/9/2001	220	<170	2,700	26	39	120	78	
	2/14/2002	660	<170	3,400	20	59	120	82	
	5/1/2002	520	<170	3,600	15	52	150	107	
	8/8/2002	240	<170	1,200	13	17	53	29.7	
	11/15/2002	310	<170	1,900	13	20	64	44.9	
	2/14/2003	730	<170	5,400	31	88	210	112	
	8/26/2003	200	<170	2,000	17	21	67	38.3	
	2/23/2004	360	<170	3,100	21	39	110	62.9	
	8/17/2004	110	<170	1,500	14	11	42	25.9	
	2/23/2005	---	---	1,600	2.8	8.6	69	28	
	8/17/2005	**---**	**---**	350	<0.50	1.0	1.9	3.2	
	11/16/2005	---	---	800	4.1	6.0	17	20	
	2/14/2006	---	---	1,000	1.2	3.9	24	15	
	5/23/2006	**---**	**---**	**730**	**0.58**	**1.5**	**7.7**	**6.1**	
MW-4	5/14/2001	<50	<170	<50	<0.5	<0.5	<0.5	<0.5	
	8/13/2001	<50	<170	<50	<0.5	<0.5	<0.5	<0.5	
	11/9/2001	<50	<170	<50	<0.5	<0.5	<0.5	<0.5	
	2/14/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	5/1/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/8/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	11/15/2002	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/14/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/26/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/23/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/17/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/23/2005	---	---	---	---	---	---	---	MW-4 analyzed for MTBE only, as of 12/2/04.

Table 2. Analytical Results for Ground Water - Monitoring Wells - 105 X Street, Eureka, California.

Sample ID	Date Sampled	TPPH (D)	TPPH(MO)	TPPH (G)	Benzene	Toluene	Ethylbenzene	Xylenes	Notes
		<---------- ppb ---------->							
MW-5	2/14/2003	89	<170	190	<0.50	<0.50	<0.50	<0.50	
	5/23/2003	110	<170	300	<0.50	<0.50	<0.50	<0.50	
	8/26/2003	<50	<170	170	<0.50	<0.50	<0.50	<0.50	
	11/17/2003	51	<170	230	<0.50	<0.50	<0.50	<0.50	
	2/23/2004	94	<170	260	<0.50	<0.50	<0.50	<0.50	
	5/13/2004	62	<170	170	<0.50	<0.50	<0.05	<0.50	
	8/17/2004	62	<170	190	<0.50	<0.50	<0.50	<0.50	
	11/23/2004	460	---	200	<0.5	<0.5	<0.5	<1	
	2/23/2005	---	---	320	---	---	---	---	Sample was flagged. See lab report for details.
	8/17/2005	**---**	**---**	120	<0.50	<0.50	<0.50	0.93	
	11/16/2005	---	---	65	2.8	3.1	1.2	5.3	
	2/14/2006	---	---	110	<0.50	<0.50	<0.50	<0.50	
	5/23/2006	**---**	**---**	**92**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-6	2/14/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	5/23/2003	<50	<170	58	<0.50	<0.50	<0.50	<0.50	
	8/26/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	11/17/2003	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	2/23/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	5/13/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	8/17/2004	<50	<170	<50	<0.50	<0.50	<0.50	<0.50	
	11/23/2004	<50	---	25	<0.5	<0.5	<0.5	<1	
	2/23/2005	---	---	---	---	---	---	---	MW-6 analyzed for MTBE only, as of 12/2/04.

Explanation:

TPH(D) = Total Petroleum Hydrocarbons as Diesel
TPH(MO) = Total Petroleum Hydrocarbons as Motor Oil
TPH(G) = Total Petroleum Hydrocarbons as Gasoline
ppb = parts per billion

Table 3. Analytical Results for Ground Water - Oxygenates - 105 X Street, Eureka, California.

Sample ID	Sample Date	t-Butyl alcohol (TBA)	MTBE	Diisopropyl ether (DIPE)	Ethyl t-butyl ether (ETBE)	t-Amyl methyl ether (TAME)	Notes
MW-1	5/14/2001	<10.0	3.9	<1.0	<1.0	<1.0	
	8/13/2001	<20	11	<1.0	<1.0	<1.0	
	11/9/2001	<20	14	<1.0	<1.0	<1.0	
	2/14/2002	<20	3.3	<1.0	<1.0	<1.0	
	5/1/2002	<20	3	<1.0	<1.0	<1.0	
	8/8/2002	<20	14	<1.0	<1.0	<1.0	
	11/15/2002	<20	3.8	<1.0	<1.0	<1.0	
	2/14/2003	<20	48	<1.0	<1.0	8.4	
	8/26/2003	<20	12	<1.0	<1.0	<1.0	
	2/23/2004	<10	76	<1.0	<1.0	42	
	8/17/2004	<10	8.1	<1.0	<1.0	<1.0	
	2/23/2005	---	220	---	---	---	
	4/21/2005	---	110	---	---	---	
	8/17/2005	---	8.1	---	---	---	
	11/16/2005	---	95	---	---	---	
	2/14/2006	---	100	---	---	---	
	5/23/2006	---	**7.6**	---	---	---	
MW-2	5/14/2001	16	73	<1.0	<1.0	<1.0	
	8/13/2001	<20	130	<1.0	<1.0	1.2	
	11/9/2001	<20	98	<1.0	<1.0	<1.0	
	2/14/2002	<20	12	<1.0	<1.0	<1.0	
	5/1/2002	22	120	<1.0	<1.0	<1.0	
	8/8/2002	<20	53	<1.0	<1.0	<1.0	
	11/15/2002	<20	29	<1.0	<1.0	<1.0	
	2/14/2003	<20	36	<1.0	<1.0	<1.0	
	8/26/2003	<20	21	<1.0	<1.0	<1.0	
	2/23/2004	<10	<1.0	<1.0	<1.0	<1.0	
	8/17/2004	<10	9.2	<1.0	<1.0	<1.0	
	2/23/2005	---	16	---	---	---	
	8/17/2005	---	19	---	---	---	
	2/14/2006	---	<1.0	---	---	---	

Table 3. Analytical Results for Ground Water - Oxygenates - 105 X Street, Eureka, California.

Sample ID	Sample Date	t-Butyl alcohol (TBA)	MTBE	Diisopropyl ether (DIPE)	Ethyl t-butyl ether (ETBE)	t-Amyl methyl ether (TAME)	Notes
MW-3	5/14/2001	<50	8.1	<2.5	<2.5	<2.5	
	8/13/2001	<20	<20	<1.0	<1.0	<1.0	
	11/9/2001	<20	<20	<1.0	<1.0	<1.0	
	2/14/2002	<20	4.9	<1.0	<1.0	<1.0	
	5/1/2002	<20	4.4	<1.0	<1.0	<1.0	
	8/8/2002	<20	6.3	<10	<1.0	1.4	
	11/15/2002	<20	6.1	<1.0	<1.0	<3.0	
	2/14/2003	<20	<12	<1.0	<1.0	<1.0	
	8/26/2003	<20	<10	<1.0	<1.0	1.2	
	2/23/2004	<10	<6.0	<1.0	<1.0	<1.0	
	8/17/2004	<10	<8.0	<1.0	<1.0	<1.0	
	2/23/2005	---	6.0	---	---	---	
	8/17/2005	---	3.1	---	---	---	
	11/16/2005	---	7.9	---	---	---	
	2/14/2006	---	7.8	---	---	---	
	5/23/2006	---	**2.8**	---	---	---	
MW-4	5/14/2001	<10.0	<0.50	<1.0	<1.0	<1.0	
	8/13/2001	<20	<1.0	<1.0	<1.0	<1.0	
	11/9/2001	<20	<1.0	<1.0	<1.0	<1.0	
	2/14/2002	<20	<1.0	<1.0	<1.0	<1.0	
	5/1/2002	<20	<1.0	<1.0	<1.0	<1.0	
	8/8/2002	<20	5.9	<1.0	<1.0	<1.0	
	11/15/2002	<20	4.7	<1.0	<1.0	<1.0	
	2/14/2003	<20	8.8	<1.0	<1.0	<1.0	
	8/26/2003	<20	6.9	<1.0	<1.0	<1.0	
	2/23/2004	<10	6.7	<1.0	<1.0	<1.0	
	8/17/2004	<10	4	<1.0	<1.0	<1.0	
	2/23/2005	---	3.1	---	---	---	
	2/14/2006	---	2.3	---	---	---	

Table 3. Analytical Results for Ground Water - Oxygenates - 105 X Street, Eureka, California.

Sample ID	Sample Date	t-Butyl alcohol (TBA)	MTBE	Diisopropyl ether (DIPE)	Ethyl t-butyl ether (ETBE)	t-Amyl methyl ether (TAME)	Notes
MW-5	2/14/2003	<20	32	<1.0	<1.0	<1.0	
	5/23/2003	<20	52	<1.0	<1.0	1	
	8/26/2003	<20	43	<1.0	<1.0	<1.0	
	11/17/2003	<20	57	<1.0	<1.0	1.6	
	2/23/2004	<10	20	<1.0	<1.0	<1.0	
	5/13/2004	<10	22	<1.0	<1.0	<1.0	
	8/17/2004	<10	55	<1.0	<1.0	2.6	
	11/23/2004	<10	33	<5	<5	<5	
	2/23/2005	---	8.8	---	---	---	
	8/17/2005	---	3.1	---	---	---	
	11/16/2005	---	2.2	---	---	---	
	2/14/2006	---	3.9	---	---	---	
	5/23/2006	---	**1.1**	---	---	---	
MW-6	2/14/2003	<20	10	<1.0	<1.0	<1.0	
	5/23/2003	<20	41	<1.0	<1.0	1.7	
	8/26/2003	<20	25	<1.0	<1.0	<1.0	
	11/17/2003	<20	25	<1.0	<1.0	<1.0	
	2/23/2004	<10	5.3	<1.0	<1.0	<1.0	
	5/13/2004	<10	15	<1.0	<1.0	<1.0	
	8/17/2004	<10	25	<1.0	<1.0	<1.0	
	11/23/2004	<10	19	<5	<5	<5	
	2/23/2005	---	9.8	---	---	---	
	8/17/2005	---	11	---	---	---	
	11/16/2005	---	9.2	---	---	---	
	2/14/2006	---	2.4	---	---	---	
	5/23/2006	---	**1.2**	---	---	---	

Explanation:

MTBE = Methyl Tertiary-butyl Ether

APPENDIX C

CHAIN OF CUSTODY
AND
LABORATORY ANALYTICAL REPORTS

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

Dave Hazard
ECM Group
290 W. Channel Rd.
Benicia, CA 94510

Lab Certificate Number: 49613
Issued: 06/05/2006

Project Number: 99-110-04
Project Name: 105 X ST.
Project Location: Eureka

Global ID: T0602393494

Certificate of Analysis - Final Report

On May 25, 2006, samples were received under chain of custody for analysis.
Entech analyzes samples "as received" unless otherwise noted. The following results are included:

Matrix	Test / Comments
Liquid	Electronic Deliverables for Geotracker
	TPH-Purgeable: GC/MS
	VOCs: EPA 5030C / EPA 8260B

Entech Analytical Labs, Inc. is certified for environmental analyses by the State of California (#2346).
If you have any questions regarding this report, please call us at 408-588-0200 ext. 225.

Sincerely,

Laurie Glantz-Murphy
Laboratory Director

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

ECM Group
290 W. Channel Rd.
Benicia, CA 94510
Attn: Dave Hazard

Project Number: 99-110-04
Project Name: 105 X ST.
Project Location: Eureka
GlobalID: T0602393494

Certificate of Analysis - Data Report

Samples Received: 05/25/2006
Sample Collected by: Client

Lab # : 49613-001 **Sample ID: MW-1** **Matrix:** Liquid **Sample Date:** 5/23/2006 2:13 PM

VOCs: EPA 5030C / EPA 8260B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Methyl-t-butyl Ether	**7.6**		1.0	1.0	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)	Analyzed by: XBian
4-Bromofluorobenzene	92.9	60 - 130	Reviewed by: dba
Dibromofluoromethane	99.9	60 - 130	
Toluene-d8	105	60 - 130	

TPH-Purgeable: GC/MS

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	ND		1.0	50	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)	Analyzed by: XBian
4-Bromofluorobenzene	87.1	60 - 130	Reviewed by: dba
Dibromofluoromethane	97.5	60 - 130	
Toluene-d8	107	60 - 130	

Lab # : 49613-002 **Sample ID: MW-3** **Matrix:** Liquid **Sample Date:** 5/23/2006 2:36 PM

VOCs: EPA 5030C / EPA 8260B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	**0.58**		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Toluene	**1.5**		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Ethyl Benzene	**7.7**		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Xylenes, Total	**6.1**		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Methyl-t-butyl Ether	**2.8**		1.0	1.0	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)	Analyzed by: XBian
4-Bromofluorobenzene	107	60 - 130	Reviewed by: dba
Dibromofluoromethane	101	60 - 130	
Toluene-d8	106	60 - 130	

TPH-Purgeable: GC/MS

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	**730**		1.0	50	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)	Analyzed by: XBian
4-Bromofluorobenzene	95.9	60 - 130	Reviewed by: dba
Dibromofluoromethane	98.3	60 - 130	
Toluene-d8	108	60 - 130	

Detection Limit = Detection Limit for Reporting.
D/P-F = Dilution and/or Prep Factor includes sample volume adjustments.
ND = Not Detected at or above the Detection Limit.
Qual = Data Qualifier

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

ECM Group
290 W. Channel Rd.
Benicia, CA 94510
Attn: Dave Hazard

Project Number: 99-110-04
Project Name: 105 X ST.
Project Location: Eureka
GlobalID: T0602393494

Certificate of Analysis - Data Report

Samples Received: 05/25/2006
Sample Collected by: Client

Lab # : 49613-003 **Sample ID: MW-5** **Matrix:** Liquid **Sample Date:** 5/23/2006 3:03 PM

VOCs: EPA 5030C / EPA 8260B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Benzene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Toluene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Ethyl Benzene	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Xylenes, Total	ND		1.0	0.50	µg/L	N/A	N/A	6/4/2006	WM1060604
Methyl-t-butyl Ether	**1.1**		1.0	1.0	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)
4-Bromofluorobenzene	101	60 - 130
Dibromofluoromethane	92.4	60 - 130
Toluene-d8	102	60 - 130

Analyzed by: XBian
Reviewed by: dba

TPH-Purgeable: GC/MS

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
TPH as Gasoline	**92**		1.0	50	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)
4-Bromofluorobenzene	94.6	60 - 130
Dibromofluoromethane	90.1	60 - 130
Toluene-d8	103	60 - 130

Analyzed by: XBian
Reviewed by: dba

Lab # : 49613-004 **Sample ID: MW-6** **Matrix:** Liquid **Sample Date:** 5/23/2006 1:50 PM

VOCs: EPA 5030C / EPA 8260B

Parameter	Result	Qual	D/P-F	Detection Limit	Units	Prep Date	Prep Batch	Analysis Date	QC Batch
Methyl-t-butyl Ether	**1.2**		1.0	1.0	µg/L	N/A	N/A	6/4/2006	WM1060604

Surrogate	Surrogate Recovery	Control Limits (%)
4-Bromofluorobenzene	93.1	60 - 130
Dibromofluoromethane	89.0	60 - 130
Toluene-d8	102	60 - 130

Analyzed by: XBian
Reviewed by: dba

Detection Limit = Detection Limit for Reporting.
D/P-F = Dilution and/or Prep Factor includes sample volume adjustments.
ND = Not Detected at or above the Detection Limit.
Qual = Data Qualifier

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

Method Blank - Liquid - VOCs: EPA 5030C / EPA 8260B

QC Batch ID: WM1060604

Validated by: dba - 06/05/06

QC Batch Analysis Date: 6/4/2006

Parameter	Result	DF	PQLR	Units
Benzene	ND	1	0.50	µg/L
Ethyl Benzene	ND	1	0.50	µg/L
Methyl-t-butyl Ether	ND	1	1.0	µg/L
Toluene	ND	1	0.50	µg/L
Xylenes, Total	ND	1	0.50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	**94.7**	60 - 130
Dibromofluoromethane	**89.0**	60 - 130
Toluene-d8	**102**	60 - 130

Method Blank - Liquid - TPH-Purgeable: GC/MS

QC Batch ID: WM1060604

Validated by: dba - 06/05/06

QC Batch Analysis Date: 6/4/2006

Parameter	Result	DF	PQLR	Units
TPH as Gasoline	ND	1	50	µg/L

Surrogate for Blank	% Recovery	Control Limits
4-Bromofluorobenzene	**88.7**	60 - 130
Dibromofluoromethane	**86.8**	60 - 130
Toluene-d8	**104**	60 - 130

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

LCS / LCSD - Liquid - VOCs: EPA 5030C / EPA 8260B

QC Batch ID: WM1060604 Reviewed by: dba - 06/05/06

QC Batch ID Analysis Date: 6/4/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
Benzene	<0.50	20	22.6	µg/L	113	70 - 130
Methyl-t-butyl Ether	<1.0	20	16.8	µg/L	84.0	70 - 130
Toluene	<0.50	20	21.1	µg/L	106	70 - 130

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**100.0**	60 - 130
Dibromofluoromethane	**93.6**	60 - 130
Toluene-d8	**97.2**	60 - 130

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	<0.50	20	20.5	µg/L	102	**9.7**	25.0	70 - 130
Methyl-t-butyl Ether	<1.0	20	16.4	µg/L	82.0	**2.4**	25.0	70 - 130
Toluene	<0.50	20	19.5	µg/L	97.5	**7.9**	25.0	70 - 130

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**101.0**	60 - 130
Dibromofluoromethane	**91.3**	60 - 130
Toluene-d8	**96.1**	60 - 130

LCS / LCSD - Liquid - TPH-Purgeable: GC/MS

QC Batch ID: WM1060604 Reviewed by: dba - 06/05/06

QC Batch ID Analysis Date: 6/4/2006

LCS

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	Recovery Limits
TPH as Gasoline	<25	120	109	µg/L	87.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**85.0**	60 - 130
Dibromofluoromethane	**82.6**	60 - 130
Toluene-d8	**99.8**	60 - 130

LCSD

Parameter	Method Blank	Spike Amt	SpikeResult	Units	% Recovery	RPD	RPD Limits	Recovery Limits
TPH as Gasoline	<25	120	106	µg/L	84.7	**2.6**	25.0	65 - 135

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**86.5**	60 - 130
Dibromofluoromethane	**82.4**	60 - 130
Toluene-d8	**101.0**	60 - 130

Entech Analytical Labs, Inc.

3334 Victor Court , Santa Clara, CA 95054 Phone: (408) 588-0200 Fax: (408) 588-0201

MS / MSD - Liquid - VOCs: EPA 5030C / EPA 8260B

QC Batch ID: WM1060604

Reviewed by: dba - 06/05/06

QC Batch ID Analysis Date: 6/4/2006

MS Sample Spiked: 49616-003

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	Recovery Limits
Benzene	0.546	20	22.1	µg/L	6/4/2006	108	70 - 130
Methyl-t-butyl Ether	7.22	20	23.8	µg/L	6/4/2006	82.9	70 - 130
Toluene	ND	20	20.5	µg/L	6/4/2006	102	70 - 130

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**99.1**	60 - 130
Dibromofluoromethane	**90.9**	60 - 130
Toluene-d8	**97.9**	60 - 130

MSD Sample Spiked: 49616-003

Parameter	Sample Result	Spike Amount	Spike Result	Units	Analysis Date	% Recovery	RPD	RPD Limits	Recovery Limits
Benzene	0.546	20	22.0	µg/L	6/4/2006	107	0.47	25.0	70 - 130
Methyl-t-butyl Ether	7.22	20	24.2	µg/L	6/4/2006	84.9	2.4	25.0	70 - 130
Toluene	ND	20	21.2	µg/L	6/4/2006	106	3.4	25.0	70 - 130

Surrogate	% Recovery	Control Limits
4-Bromofluorobenzene	**97.2**	60 - 130
Dibromofluoromethane	**91.3**	60 - 130
Toluene-d8	**99.7**	60 - 130

Entech Analytical Labs, Inc. Chain of Custody / Analysis Request

3334 Victor Court (408) 588-0200
Santa Clara, CA 95054 (408) 588-0201 - Fax

ELAP No. 2346

Attention to: D Hazard	Phone No.: 707 751-0655	Purchase Order No.:	Invoice to: (If Different)	Phone:
Company Name: ECM Group	Fax No.: 707 751-0653	Project No. / Name: 99-110-04 Eureka	Company: Redwood Oil Company	
Mailing Address: P.O. Box 802	Email Address: ecmgrp@aol.com		Billing Address: (If Different)	
City: Benicia	State: CA Zip Code: 94510	Project Location:	City: State: Zip:	

Entech Order ID:

EDF ☒ Global ID: 49613

Turn Around Time

☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☐ 4 Day ☐ 5 Day
☒ 10 Day

Sample Information

Sampler _____

Client ID	Field Point	Date	Time	Entech Lab. No.	Matrix	No. of Containers	EPA 8260B Full List	8260 Petroleum: List includes: Gas (BTEX) MtBE EtBE, TBA, TAME, DIPE, 1,2-DCA, EDB	MTBE only by 8260	EPA 8270: Base/Neutral/Acid Organics 8270 Full List PAHs Only PAHs - SIM	Pesticides-8081 PCBs - 8082	TPH Extractable: Diesel, Motor Oil, Other w/ Si-Gel Cleanup	TPH Gas, BTEX, MtBE by EPA 8015/8021B	Metals - Circle Below Total Dissolved STLC TCLP	Remarks Instructions
MW-1	001	5/23	2:13			5		X							
MW-3	002	5/23	2:36			5		X							
MW-5	003	5/23	3:03			5		X							
MW-6	004	5/23	1:50			5			X						

Relinquished by:	Received by:	Date:	Time:
		5/24/06	0945
	Received by:	Date:	Time:
	Thuson	5/25/06	1200
Relinquished by:	Received by:	Date:	Time:

Lab Use:

Metals: Al, As, Sb, Ba, Be, Bi, B, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Hg, Mo, Ni, K,Si, Ag, Na, Se, Tl, Sn, Ti, Zn, V

☐ Plating ☐ LUFT-5 ☐ RCRA-8 ☐ PPM-13 ☐ CAM-17

If any N's, Explain:

Lab Use:

Samples: Iced Y/N Temperature: _____ Shipment Method: _____

Appropriate Containers/Preservatives: Y/N Custody Seals? Y/N

Labels match CoC? Y/N Headspace? Y/N Seperate Receipt Log Y/N

APPENDIX D

WATER SAMPLING DATA SHEETS

WATER LEVEL &
PRODUCT MEASUREMENTS

ECM group

PROJECT NAME & NUMBER: Eureka 99-110-04

DATE: 5-23-06

BY: DW

WELL ID	TIME MEASURED	DEPTH TO PRODUCT (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH	COMMENTS: (well condition, odor, etc.)
MW 1	1:15		2.38	9.82	2"
MW-2	12:35		3.3	10.10	condition of well is good 2" water in well.
MW-3	1:05		2.5	10.10	2"
MW-4	12:55		3.18	9.82	2"
MW-5	1:20		2.91	11.51	2"
MW-6	1:12		2.50	11.25	2"

WATER SAMPLING DATA

Job Name _____ Job Number _____

Well Number MW-6 Date _____ Time 1:30

Well Diameter 2" Well Depth (spec.) _____ Well Depth (sounded) 11.25

Depth to Water (static) 2.50 TOC elev. _____

G.W. Elev. _____ Maximum Drawdown Limit (if applicable) _____

Initial height of water in casing 8.75 Volume 1.43 gallons

Total to be evacuated = 3 x Initial Volume 4.28 gallons

Formulas/Conversions
r = well radius in ft
h = ht of water col. in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft

~~Start~~ Stop Time	~~Stop~~ Start Time	Bailed	Pumped	Cum. Gal.
1:30	1:31	✓		

Pumped or Bailed Dry? ___Yes ✓No After _____ gallons Recovery Rate _____

Water color _____ Odor _____

Description of sediments or material in sample: _____

Additional Comments: _____

CHEMICAL DATA

Reading No.	1	2	3	4	5	6	7
Time	1:35	~~1:40~~	1:45				
Gallons							
Temp. (degree F)	61.1	59.8	59.3				
pH	6.43	6.44	6.31				
EC (umhos/cm)	283	295	286				
Special Conditions							

SAMPLES COLLECTED

Sample ID ml	Bottle/ cap	Filtered (size, u)	Preservative (type)	Refrig. (R, NR)	Lab (Init)	Analysis Requested
samples taken 1:50.						

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WATER SAMPLING DATA

Job Name _____ Job Number _____

Well Number MW-1 Date 5-23-05 Time 1:54

Well Diameter _____ Well Depth (spec.) _____ Well Depth (sounded) 9.82

Depth to Water (static) 2.38 TOC elev. _____

G.W. Elev. _____ Maximum Drawdown Limit (if applicable) _____

Initial height of water in casing 7.44 Volume 1.2 gallons

Total to be evacuated = 3 x Initial Volume 3.6 gallons

Formulas/Conversions
r = well radius in ft
h = ht of water col. in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft

Stop Time	Start Time	Bailed	Pumped	Cum. Gal.

Pumped or Bailed Dry? ___Yes ___No After _____ gallons Recovery Rate _____

Water color _____ Odor _____

Description of sediments or material in sample: _____

Additional Comments: _____

CHEMICAL DATA

Reading No.	1	2	3	4	5	6	7
Time	2:00	2:04	2:08				
Gallons							
Temp. (degree F)	60.3	60.1	60.1				
pH	6.42	6.50	6.59				
EC (umhos/cm)	288	307	303				
Special Conditions							

SAMPLES COLLECTED

Sample ID	Bottle/ ml	cap	Filtered (size, u)	Preservative (type)	Refrig. (R, NR)	Lab (Init)	Analysis Requested

Samples taken @ 2:13

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WATER SAMPLING DATA

Job Name _____ Job Number _____

Well Number MW-3 Date 5-27-05 Time 2:20

Well Diameter _____ Well Depth (spec.) _____ Well Depth (sounded) 10.10

Depth to Water (static) 2.5 TOC elev. _____

G.W. Elev. _____ Maximum Drawdown Limit (if applicable) _____

Formulas/Conversions
r = well radius in ft
h = ht of water col. in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_4" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft

Initial height of water in casing 7.6 Volume 1.24 gallons

Total to be evacuated = 3 x Initial Volume 3.72 gallons

Stop Time	Start Time	Bailed	Pumped	Cum. Gal.

Pumped or Bailed Dry? ___Yes ___No After _____ gallons Recovery Rate _____

Water color _____ Odor _____

Description of sediments or material in sample: _____

Additional Comments: _____

CHEMICAL DATA

Reading No.	1	2	3	4	5	6	7
Time	2:23	2:27	2:33				
Gallons	1.24						
Temp. (degree F)	62.0	61.5	61.7				
pH	6.75	6.77	6.75				
EC (umhos/cm)	343	349	343				
Special Conditions							

SAMPLES COLLECTED

Sample ID ml	Bottle/ cap	Filtered (size, u)	Preservative (type)	Refrig. (R, NR)	Lab (Init)	Analysis Requested

Sample taken @ 2:36

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WATER SAMPLING DATA

Job Name _____ Job Number _____

Well Number MW-5 Date 5-23-06 Time 2:45

Well Diameter 2" Well Depth (spec.) _____ Well Depth (sounded) 11-51

Depth to Water (static) 2.91 TOC elev. _____

G.W. Elev. _____ Maximum Drawdown Limit (if applicable) _____

Initial height of water in casing 8.6 Volume 1.42 gallons

Total to be evacuated = 3 x Initial Volume 4.21 gallons

Formulas/Conversions
r = well radius in ft
h = ht of water col. in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft

Stop Time	Start Time	Bailed	Pumped	Cum. Gal.

Pumped or Bailed Dry? ___Yes ___No After _____ gallons Recovery Rate _____

Water color _____ Odor _____

Description of sediments or material in sample: _____

Additional Comments: _____

CHEMICAL DATA

Reading No.	1	2	3	4	5	6	7
Time	2:52	255	258				
Gallons							
Temp. (degree F)	60.8	59.8	59.4				
pH	6.51	6.52	6.53				
EC (umhos/cm)	239	239	234				
Special Conditions							

SAMPLES COLLECTED

Sample ID ml	Bottle/ cap	Filtered (size, u)	Preservative (type)	Refrig. (R, NR)	Lab (Init)	Analysis Requested
Sampled @ 3:03						

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

APPENDIX E

ECM STANDARD OPERATING PROCEDURE

ECM STANDARD OPERATING PROCEDURE

GROUND WATER SAMPLING

The following describes sampling procedures used by ECM field personnel to collect and handle ground water samples. Before samples are collected, careful consideration is given to the type of analysis to be performed so that precautions are taken to prevent loss of volatile components or contamination of the sample, and to preserve the sample for subsequent analysis. Wells will be sampled no less than 24 hours after well development. Collection methods specific to ground water sampling are presented below.

Prior to sampling, each well is purged of a minimum of three well casing volumes of water using a steam-cleaned PVC bailer, or a pre-cleaned pump. Temperature, pH and electrical conductivity are measured at least three times during purging. Purging is continued until these parameters have stabilized (i.e., changes in temperature or conductivity do not exceed 10% and changes in pH do not exceed one unit).

Ground water samples are collected from the wells/borings with steam-cleaned or disposable Teflon bailers. The water samples are decanted into the appropriate container for the analysis to be performed. Pre-preserved sample containers may be used or the analytic laboratory may add preservative to the sample upon arrival. Duplicate samples are collected from each well as a back-up sample and/or to provide quality control. The samples are labeled to include the project number, sample ID, date, preservative, and the field person's initials. The samples are placed in polyethylene bags and in an ice chest (maintained at 4˚C with blue ice or ice) for transport under chain-of-custody to the laboratory.

The chain-of-custody form includes the project number, analysis requested, sample ID, date analysis and the ECM field person's name. The form is signed and dated (with the transfer time) by each person who yields or receives the samples beginning with the field personnel and ending with the laboratory personnel.